

CLAIMS

1 ~~Sub A~~ 1. A downhole jar apparatus for use in oil and gas wells,
2 comprising:

3 a) an elongated tool body having an upper end portion
4 and a lower end portion, and a longitudinal flow bore that enables
5 fluid to flow through the tool body from the upper end to the lower
6 end;

7 b) an upper piston mounted at the upper end portion of
8 the tool body, movable between upper and lower positions and having
9 a valve seat;

10 c) a lower piston mounted below the upper piston,
11 movable between upper and lower positions and having a valve seat;

12 d) a first valving member for sealing the valve seat
13 of the upper piston so that hydrostatic pressure can build up above
14 the upper piston;

15 e) a second valving member disposed in between the
16 upper and lower piston and having a lower valving end portion that
17 forms a seat with the lower piston seat, the second valving member
18 being movable downwardly in the tool body bore responsive to a
19 pressure increase above the upper piston;

20 f) a trip mechanism for separating the second valving
21 member from the lower piston seat when a predetermined pressure
22 value is overcome;

23 g) a return mechanism for returning the first piston
24 to its upper position when the trip mechanism separates the second
25 valving member from the lower piston seat; and

26 h) wherein the tool body has an anvil portion
27 positioned above the lower piston for receiving force from the
28 lower piston when it is returned to its upper position by the
29 return mechanism.

1 2. The jar apparatus of claim 1 wherein the tool body

2 includes upper and lower tool body sections attached together end
3 to end with a slip joint.

1 3. The jar apparatus of claim 1 wherein the first valving
2 member is a member that can be transmitted to the tool body via a
3 work string.

1 4. The jar apparatus of claim 3 wherein the first valving
2 member is a ball shaped valving member.

1 5. The jar apparatus of claim 1 further comprising a tappet
2 that is positioned below the upper piston and above the second
3 valving member.

6. The jar apparatus of claim 5 wherein the tappet and upper
piston are separately movable members, and a seat interface is
provided at the interface between the bottom of the upper piston
at top of the tappet.

7. The jar apparatus of claim 1 wherein the second valving
member has a generally flat upper end.

1 8. The jar apparatus of claim 1 wherein the second valving
2 member has a generally flat lower end.

1 9. The jar apparatus of claim 1 wherein the trip mechanism
2 includes a compressible member.

1 10. The jar apparatus of claim 9 wherein the compressible
2 member is a spring.

1 11. The jar apparatus of claim 9 wherein the trip mechanism

2 includes a compressible spring and a trip washer that cooperates
3 with an annular shoulder on the tool body to separate the second
4 valving member from the lower piston as the second valving member
5 moves downwardly in the tool body.

1 12. The jar apparatus of claim 1 wherein the return mechanism
2 includes a compressible member.

1 13. The jar apparatus of claim 12 wherein the compressible
2 member is a spring.

1 14. The jar apparatus of claim 1 wherein the valving member
2 is preliminarily secured to the tool body with one or more shear
3 pins that shear as hydrostatic fluid pressure is increased.

1 15. A downhole jar apparatus for use in oil and gas wells,
2 comprising:

3 a) an elongated tool body supportable by a work string
4 and having an upper end portion and a lower end portion, and a
5 longitudinal flow bore that enables pressurized fluid to flow
6 through the tool body from the upper end to the lower end;

7 b) an upper piston mounted at the upper end portion of
8 the tool body, movable between upper and lower positions and having
9 a valve seat;

10 c) a lower piston mounted below the upper piston,
11 movable between upper and lower positions in the tool body and
12 having a valve seat;

13 d) a first valving member for sealing the valve seat
14 of the upper piston so that pressurized fluid can build hydrostatic
15 pressure above the first valving member and upper piston;

16 e) wherein the upper piston is an assembly that
17 includes an upper piston member and a tappet that carries the upper

Sub 18 piston seat, the tappet and upper piston member being separable
19 members that move downwardly together when the first valving member
20 seals upon the valve seat of the upper piston assembly;

21 f) a second valving member disposed in between the
22 upper and lower pistons and having a lower valving end portion that
23 forms a seat with the lower piston seat;

24 g) a trip mechanism for separating the second valving
25 member from the lower piston seat when a predetermined pressure
26 value in the tool body flow bore above the upper piston and first
27 valving member is overcome;

28 h) a return mechanism for returning the first piston
29 to its upper position when the trip mechanism separates the second
30 valving member from the lower piston seat; and

31 i) wherein the tool body has an anvil portion
32 positioned above the lower piston for receiving force from the
33 lower piston when it is returned to its upper position by the
34 return mechanism.

16. A downhole jar apparatus for use in oil and gas wells,
comprising:

4 a) an elongated tool body supportable by a work string
5 and having an upper end portion and a lower end portion, and a
6 longitudinal flow bore that enables pressurized fluid to flow
7 through the tool body from the upper end to the lower end;

8 b) an upper piston mounted at the upper end portion of
9 the tool body, movable between upper and lower positions and having
10 a valve seat;

11 c) a lower piston mounted below the upper piston,
12 movable between upper and lower positions in the tool body and
13 having a valve seat;

14 d) a first valving member for sealing the valve seat
of the upper piston so that pressurized fluid can build hydrostatic

SM 15 pressure above the first valving member and upper piston;

16 e) a second valving member disposed in between the
17 upper and lower pistons and having a lower valving end portion that
18 forms a seat with the lower piston seat;

19 f) a trip mechanism for separating the second valving
20 member from the lower piston seat when a predetermined pressure
21 value in the tool body flow bore above the upper piston and first
22 valving member is overcome;

23 g) a return mechanism for returning the first piston
24 to its upper position when the trip mechanism separates the second
25 valving member from the lower piston seat; and

26 h) an anvil carried by the tool body for receiving
27 blows from the lower piston when the lower piston travels upwardly
28 in the tool body.